Mapping the Landscape of Artificial Intelligence Applications against COVID-19

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Abstract

COVID-19, the disease caused by the SARS-CoV-2 virus, has been declared a pandemic by the World Health Organization, which has reported over 18 million confirmed cases as of August 5, 2020. In this review, we present an overview of recent studies using Machine Learning and, more broadly, Artificial Intelligence, to tackle many aspects of the COVID19 crisis. We have identified applications that address challenges posed by COVID-19 at different scales, including: molecular, by identifying new or existing drugs for treatment; clinical, by supporting diagnosis and evaluating prognosis based on medical imaging and non-invasive measures; and societal, by tracking both the epidemic and the accompanying infodemic using multiple data sources. We also review datasets, tools, and resources needed to facilitate Artificial Intelligence research, and discuss strategic considerations related to the operational implementation of multidisciplinary partnerships and open science. We highlight the need for international cooperation to maximize the potential of AI in this and future pandemics.